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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/659,748	09/11/2003	Manabu Nakamura	031140	3468

38834 7590 11/28/2008

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EXAMINER	
SMITH, BRADLEY	
ART UNIT	PAPER NUMBER
2894	
MAIL DATE	DELIVERY MODE
11/28/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/659,748	NAKAMURA ET AL.	
	Examiner	Art Unit	
	Bradley K. Smith	2894	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 September 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3 and 6-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 6-19* is/are rejected.

7)☒ Claim(s) *20* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *9/13/03* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1, 2, 3, 6, 8,11, 12 ,14, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wong (US Patent 5,423,944) in view of Dobuzinsky et al (US Patent 5,412,246), Murakawa et al. (US 2007/0085154) and Mahajani et al. (US 2003/0155582). Wong disclose forming a first insulation film using a strong acid solution on the face of the substrate. With regards to claims 6 and 12, Wong disclose the use of nitric acid (see column 1 lines 20-25). With regards to claim 8 and 14, Wong disclose the use of ozone in an acidic solution (see column 2 lines 50-65). However Wong fails to disclose forming a second insulation film by low temperature processing and cleaning (removing defects near the surface) the wafer (substrate) (see column 1 lines 20-25 and see column 2 lines 50-65), plasma processing with a radial line slot antenna through microwave excitation and a SONOS transistor. Dobuzinsky et al. disclose the formation of a second dielectric layer using low temperature processing (title). Murakawa disclose forming a diectric using a plasma processing with a radial line slot antenna through microwave excitation (see abstract and [0007]). Mahajani disclose the formation of an conventional SONOS transistor [0024]. With regards to claims 2 and 3, Dobuzinsky et al.

disclose using a low temperature oxidation plasma(see title) . With regards to claims 11, 17 and 18 Dobuzinsky et al. disclose forming gate oxide films(see abstract). With regards to claim 20, Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Wong, Dobuzinsky et al, Murakawa et al. and Mahajani in view of because the oxidizing agents such as nitric acid help remove defects (see Wong column 1 lines 20-25), the radial slot line antenna will form a high quality film at low temperatures with fewer dangling bonds (Murakawa et al. [0007] and the SONOS device was well known (conventional) [0024] .

2. Claims 7, 9,13, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wong (US Patent 5,423,944) in view of Dobuzinsky et al (US Patent 5,412,246), Murakawa et al. (US 2007/0085154), and Mahajani et al. (US 2003/0155582), as applied to claim 3 above, and further in view of Muramatsu et al. (US Patent 6,468,841). Wong and Dobuzinsky et al disclose the forming of two insulation layers. However they fail to teach the use of nitric acid and an ozone containing solution (see above). Whereas Muramatsu disclose the use of nitric acid and an ozone containing solution at temperature of 420 degrees C (see column 10 line 5-16). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Wong, Dobuzinsky et al, Murakawa et al. and Mahajani in view of Muramatsu et al. because the oxidizing agents such as nitric acid help remove defects (see Wong column 1 lines 20-25)), the radial slot line antenna will form a high quality film at low temperatures with fewer dangling bonds (Murakawa et al. [0007] and the SONOS device was well known (conventional) [0024] .

3. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wong (US Patent 5,423,944) in view of Dobuzinsky et al (US Patent 5,412,246) Murakawa et al. (US 2007/0085154) and Mahajani et al. (US 2003/0155582). Dobuzinsky et al Wong et al. Murakawa et al. and Mahajani discloses the claimed invention except for the first insulation film has a film thickness of 1nm or more. It would have been obvious to one of ordinary skill in the art at the time the invention was made to make an oxide film greater than one nanometer, because if the dielectric film were less than one nanometer it would lose its dielectric properties. In Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. cir. 1984), cert. denied, 469 U.S. 830, 225. USPQ 232 (1984), the Federal Circuit held that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device.

4. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wong (US Patent 5,423,944) in view of Dobuzinsky et al (US Patent 5,412,246) Murakawa et al. (US 2007/0085154) and Mahajani et al. (US 2003/0155582). Wong disclose forming a first insulation film using a strong acid solution on the face of the substrate. However Wong fails to disclose forming a second insulation film by low temperature processing after a fixed period of time. Whereas Dobuzinsky et al. disclose the formation of a second 'dielectric layer using low temperature processing after a fixed period of time, and then leaving the second dielectric layer for a fixed period of time. The examiner asserts that since the Dobuzinsky et al. forms the nitride after the oxide is formed inherently there is a fixed period of time and the nitride is left for a

fixed period (otherwise distinct layer of silicon oxide and silicon nitride would not have been formed as shown in figure 59. Therefore it would have been obvious to one of ordinary skill in the ad at the time the invention was made to combine the teachings of Wong ,Dobuzinsky et al Murakawa et al. and Mahajani because the oxidizing agents such as nitric acid help remove defects (see Wong column 1 lines 20-25)), the radial slot line antenna will form a high quality film at low temperatures with fewer dangling bonds (Murakawa et al. [0007]) and the SONOS device was well known (conventional) (Mahajani et al. [0024]) .

Response to Arguments

Applicant's arguments with respect to claims 1-3, 6-19 have been considered but are moot in view of the new ground(s) of rejection.

Allowable Subject Matter

Claim 20 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art of record fails to teach or suggest, with respect to the entire claim, said SONOS transistor is an embedded-bit-line-type transistor.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bradley K. Smith whose telephone number is 571-272-1884. The examiner can normally be reached on 10-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim Nguyen can be reached on 571-272-2402. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Bradley K Smith/
Primary Examiner, Art Unit 2894